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## Man-Made U.F.O.s—The Problem of Identifying the Launching State of a Space Object

Great progress has been made by the United Nations in adopting principles and procedures governing the activities of states in the exploration and use of outer space. Following the General Assembly Resolution 1962 (XVIII), entitled "Declaration of legal principles governing the activities of states in the exploration and use of outer space," three treaties were drafted and opened for signature:

- (i) the Treaty on principles governing the activities of states in the exploration and use of outer space, including the moon and other celestial bodies (entered into force in 1967);
- (ii) the Agreement on the rescue of astronauts, the return of astronauts and the return of objects launched into outer space (entered into force in 1968), and
- (iii) the Convention on international liability for damage caused by space objects (entered into force in 1972).

Are the rules of international law as set out in the Liability Convention adequate and effective, in order to ensure the prompt payment of a full and equitable measure of compensation to the victims of damage caused by space objects?

The principle of international liability for damage was first referred to in Resolution 1962 (XVIII) of the General Assembly. It was reiterated in article 7 of the Outer Space Treaty which provides that each state party to the treaty which launches an object into outer space, shall be internationally liable for damage by such object to another state party to the

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treaty, or to its natural or juridical persons. This provision was amplified in the Liability Convention.

This Convention provides that a launching state shall be absolutely liable to pay compensation for damage caused by its space object (this term includes component parts of a space object as well as its launch vehicle and parts thereof—article I), on the surface of the earth or to aircraft in flight (article II). The term “damage” means loss of life, personal injury or other impairment of health; or loss of or damage to property (article I). Claims for compensation for damage are to be presented to the launching state by the state which suffered damage, or whose natural or juridical persons suffered damage (article VIII).

This claim is to be presented through diplomatic channels (article IX). If no settlement of a claim is arrived at through diplomatic negotiations within one year from the date on which the claimant state notifies the launching state that it has submitted the documentation of its claim, the parties concerned shall establish a Claims Commission at the request of either party (article XIV). The appointment to this Commission shall be made within two months of the request for the establishment of the Commission. If the two members appointed cannot reach agreement on the choice of a chairman within four months of the request for the establishment of the Commission, either party may request the Secretary-General of the United Nations to appoint the chairman, within a further period of two months (article XV).

The Claims Commission shall determine its own procedure (article XVI), and shall decide the merits of the claim for compensation and determine the amount of compensation payable, if any (article XVIII); its decision shall be final and binding if the parties have so agreed; otherwise the commission shall render a final and recommendatory award, which the parties shall consider in good faith; the decision or award shall be given as promptly as possible and no later than one year from the date of establishment of the Commission, unless an extension of this period is found necessary by the Commission (article XIX).

According to the preamble to the Liability Convention, the states parties to this convention recognize “the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage.”

Under the rules and according to the procedures set out in this Convention, the victim, and the state of which he is a national (or a permanent resident or in the territory of which the damage was caused), must first of

all establish that the damage was caused by a space object, by a launch vehicle, or by parts of such objects. Then the claims procedure may be set in motion. Even if the identity of the launching state is not disputed, it may well take years until the Claims Commission can decide the merits of the claim, and determine the amount of compensation payable, unless settlement of the claim is arrived at earlier through diplomatic negotiations. However, none of these procedures ensure "prompt payment."

How serious is the risk of damage caused by space objects on the surface of the earth?

Bin Cheng<sup>1</sup> referred to the ever-increasing number of objects which are being launched into space and orbiting the earth; he considered that there can be little doubt regarding the importance and urgency of the problem, and he mentioned a statement made by a Japanese delegate to the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, concerning injuries suffered by sailors on a Japanese cargo ship from a device launched into outer space. Bin Cheng also referred to a cask of nuclear fuel which had to be jettisoned by the Apollo XIII spacecraft "which is believed to be safely buried in the depth of the Pacific Ocean."

Peter H. Sand<sup>2</sup> also considered that with the increasing number of space launchings, returning space instrumentalities, boosters and debris have become a problem in the earth airspace and on the surface. He mentioned that there have been at least 12 reported incidents of this nature since 1958.

Lay and Taubenfeld<sup>3</sup> considered that the incidence of damage would be low, though a more substantial risk is, in their view, involved in the possible return to earth of a booster rocket still containing unexpended fuel, and radioactive debris.

A recent incident in New Zealand illustrates the danger to persons and property on the surface of the earth from returning space debris, and the difficulty experienced in identifying the launching state:

Between 3 April and 12 May 1972 five spherical titanium alloy pressure vessels were found in Canterbury Province, New Zealand, near the town of Ashburton. They were clearly space debris associated with the decay of a large object in the atmosphere, which occurred at 1 a.m. local time on 3 April 1972. Four of these vessels were of 379 mm. diameter, one of 249 mm. Three weighed 15 kg., the fourth (owing to melting of a section) 13.6

<sup>1</sup>Liability for Spacecraft, *Current Legal Problems* 1970, p.216/7.

<sup>2</sup>Space Programmes and International Environment Protection (1972) 21 *ICLQ*, 43 *et seq.*

<sup>3</sup>The Law relating to Activities of Man in Space (1970), pp.137-149.

kg., and the fifth 4.3. kg. Calculations carried out in New Zealand suggested that these vessels landed with a velocity between 161 km/h and 322 km/h. If they had landed in the town of Ashburton they could have caused considerable damage.

Published data on the re-entry of space objects<sup>4</sup> into the atmosphere indicated that the only two space vehicles with which the vessels could possibly have been associated, were launched by the Soviet Union (No. 5921, associated with the Soviet COSMOS 482 satellite) and by the United States of America (Titan 3c). According to the orbital inclination of the U.S. space object, it would not pass over New Zealand, but the track of the Soviet satellite which was expected to decay on 2 April 1972, was compatible with observed sightings and landings.

Stenciled markings had been painted on the vessels, but these had been burnt off in the heat of re-entry. Under infra-red light it has been possible to distinguish some Russian letters beyond reasonable doubt, but also a letter N which is not found in the Russian alphabet.

The examination of the vessels carried out by New Zealand scientists led them to conclude that they were of Soviet rather than American origin.

Pursuant to article 5(1) of the Agreement on the Rescue of Astronauts and the Return of Objects launched into Outer Space, the New Zealand government notified the Soviet authorities and the Secretary-General of the United Nations that the objects had been found. The Soviet authorities subsequently disclaimed ownership of the space objects, and later on the United States authorities confirmed that the objects were not of American origin.

In the circumstances, no state was prepared to admit responsibility for launching the objects. A very slight change in the course of the space vehicle from which these objects originated may have caused them to land in a populated area, and they could possibly have caused severe damage or loss of life. This was pointed out by the New Zealand delegate to the meeting of the First Committee of the General Assembly of the United Nations on 18 October 1972. He added: "My delegation believes it probable that, if such damage or loss of life had occurred, our task in finding a State willing to accept responsibility for launching these objects would not have been any easier."

It is idle to speculate what the attitude of the Soviet authorities would have been if the objects had caused damage.

It is doubted whether the proposed Convention on the registration and marking of objects launched into outer space, which is under consideration

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<sup>4</sup>Published by the United States National Aeronautics and Space Agency.

by the Legal Sub-Committee of the Outer Space Committee, will facilitate the identification of space objects returning to the surface of the earth. According to Charles Dalfen<sup>5</sup> the Legal Sub-Committee considered that a marking system to survive re-entry is not considered technically practical at the present time.

The legal, political and factual situation, as outlined above, does not ensure the prompt payment of compensation of victims of damage caused by space objects. The Liability Convention can be considered as a first step toward protecting the victims of returning space objects, and as the best result which could be achieved for the time being. The proposed Registration Convention will be useful, but not of assistance in every case, because it will be practically impossible to put indelible marks on every piece and portion of a space object which might return to the surface of the earth and cause damage.

The exploration and use of outer space still is an ultra-hazardous activity and states have recognized, in the preamble to the Liability Convention, "that, notwithstanding the precautionary measures to be taken by states and intergovernmental organizations involved in the launching of space objects, damage may on occasion be caused by such objects." The states parties to this Convention have also recognized in the preamble, "the common interest of all mankind in furthering the exploration and use of outer space for peaceful purposes." The Outer Space Treaty (article 1) establishing the principle that the exploration and use of outer space shall be carried out "for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."

If the benefits from the exploration of outer space are to be shared by all countries, should not all states accept responsibility for compensating victims for any damage caused by a space object within their territory or to their national aircraft in flight? Provided that a victim can establish that the damage suffered was caused by a space object (as defined in article I of the Liability Convention), he should be entitled to compensation by the state where the damage occurred, and in accordance with the law of this state, without having to identify the launching state. This rule ought to apply also for the benefit of nationals of the launching state, but not for the benefit of persons who are participating in the operation of the space object, or during such time as they are in the immediate vicinity of a planned launching, or recovery area as the result of an invitation by the launching state (article VII of the Liability Convention).

<sup>5</sup>*Towards an International Convention on the Registration of Space Objects: The Gestation Process.* (1971) 9 *THE CANADIAN YEARBOOK OF INTERNATIONAL LAW*, 265.

The only exoneration from the absolute liability should be gross negligence or an act or omission done with intent to cause damage on the part of the victim (see article VI of the Liability Convention).

The state that has settled the claim of a victim, if it is not the launching state, should be reimbursed by the launching state upon proof of the compensation paid for damage caused by its space object.

This arrangement, which would require to be incorporated in an international agreement amending the Liability Convention, and in uniform municipal legislation passed by all the states parties to this Convention, would give victims of damage caused by space objects a better chance of obtaining prompt payment of a full and equitable measure of compensation. States, rather than the natural or juridical persons who or which sustained damage, should accept the delays and uncertainties of having to present claims through diplomatic channels, of having to wait for the commission's decision or award, and of having to bear the risk that the launching state may not consider the award "in good faith" (see article XIX of the Liability Convention).